

20177YP

## WHAT IS CLAIMED:

1. An isolated DNA comprising nucleotides encoding a polypeptide having an amino acid sequence selected from the group consisting of SEQ.ID.NO.:3, SEQ.ID.NO.:5, and SEQ.ID.NO.:29.
2. The DNA of claim 1 comprising a nucleotide sequence selected from the group consisting of: SEQ.ID.NO.:1, SEQ.ID.NO.:2, SEQ.ID.NO.:4, SEQ.ID.NO.:28, positions 105-1,859 of SEQ.ID.NO.:2, positions 105-1,409 of SEQ.ID.NO.:4, and positions 11-1,663 of SEQ.ID.NO.:28.
3. An isolated DNA comprising a sequence that is identical to SEQ.ID.NO.:2 except that it contains a different nucleotide at a position selected from the group consisting of positions 120, 121, 122, 357, 358, 359, 381, 382, 383, 783, 784, 785, 999, 1000, and 1001.
4. An isolated DNA that hybridizes under stringent conditions to a nucleotide sequence selected from the group consisting of: SEQ.ID.NO.:1, SEQ.ID.NO.:2, SEQ.ID.NO.:4, and SEQ.ID.NO.:28.
5. An expression vector comprising the DNA of claim 1.
6. A recombinant host cell comprising the DNA of claim 1.
7. A CG1CE protein, substantially free from other proteins, having an amino acid sequence selected from the group consisting of SEQ.ID.NO.:3, SEQ.ID.NO.:5, and SEQ.ID.NO.:29.
8. The CG1CE protein of claim 8 containing a single amino acid substitution.
9. The CG1CE protein of claim 9 where the substitution occurs at position 6, 85, 93, 227, or 299.

20177YP

10. The CG1CE protein of claim 9 where the substitution is a conservative substitution.

5 11. The CG1CE protein of claim 8 containing two amino acid substitutions.

10 12. The CG1CE protein of claim 8 containing an amino acid substitution where the substitution does not occur in a position where the amino acid present in CG1CE is also present in the corresponding position in one of the *C. elegans* proteins whose partial amino acid sequence is shown in Figure 7.

15 13. An antibody that binds specifically to a CG1CE protein where the CG1CE protein has the amino acid sequence selected from the group consisting of SEQ.ID.NO.:3 and SEQ.ID.NO.:5.

14. A method of diagnosing whether a patient carries a mutation in the CG1CE gene that comprises:

- 20 (a) providing a DNA sample from the patient;  
(b) providing a set of PCR primers based upon SEQ.ID.NO.:2 or SEQ.ID.NO.:4;  
(c) performing PCR on the DNA sample to produce a PCR fragment from the patient;  
(d) determining the nucleotide sequence of the PCR fragment from  
25 the patient;  
(e) comparing the nucleotide sequence of the PCR fragment from the patient with the nucleotide sequence of SEQ.ID.NO.:2 or SEQ.ID.NO.:4;  
where a difference between the nucleotide sequence of the PCR fragment from the patient with the nucleotide sequence of SEQ.ID.NO.:2 or  
30 SEQ.ID.NO.:4 indicates that the patient carries a mutation in the CG1CE gene.

15. The method of claim 15 where the DNA sample is genomic DNA.

16. The method of claim 15 where the DNA sample is cDNA.
17. A DNA or RNA oligonucleotide probe comprising at least 18 contiguous nucleotides of at least one of a sequence selected from the group consisting of: SEQ.ID.NO.:1, SEQ.ID.NO.:2, SEQ.ID.NO.:4, and SEQ.ID.NO.:28.
18. A method for determining whether a substance is an activator or an inhibitor of a CG1CE protein or a mutant CG1CE protein comprising:
- (a) recombinantly expressing CG1CE protein or mutant CG1CE protein in a host cell;
- (b) measuring the biological activity of CG1CE protein or mutant CG1CE protein in the presence and in the absence of a substance suspected of being an activator or an inhibitor of CG1CE protein or mutant CG1CE protein; where a change in the biological activity of the CG1CE protein or the mutant CG1CE protein in the presence as compared to the absence of the substance indicates that the substance is an activator or an inhibitor of CG1CE protein or mutant CG1CE protein.